

ADDITIONAL PANAMANIAN SPECIES OF *BURMEISTERA* (CAMPANULACEAE: LOBELIOIDEAE)¹

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ABSTRACT

Burmeistera hammelii Wilbur and *B. mcvaughii* Wilbur are newly described from Panama. *Burmeistera obtusifolia*, previously known only from Costa Rica, is recorded for the first time from Panama. A key to all Panamanian species of *Burmeistera* is included.

Barry Hammel spent approximately eighteen months as the Missouri Botanical Garden's collector in Panama. He proved himself to be a very zealous collector and his particular attention to the genus *Burmeistera*, for which I am most appreciative, resulted in the following additions to the known lobeliad flora of Panama. Since the two previously undescribed species of *Burmeistera* and the range extension of a Costa Rican species into Panama are a significant increase in the number of species known from Panama, it seems desirable to include a new key to facilitate their determinations. Species numbered 1–16 are described in Wilbur (1976) while X1–X3 are discussed after the present key.

1. Median cauline leaves more than 8 times as long as wide, narrowly linear 1. *B. chiriquiensis* Wilbur
- 1'. Median cauline leaves less than 6 times as long as wide, ovate, lanceolate, elliptic or at least not narrowly linear.
 2. Anthers externally pilose with golden trichomes; plants vegetatively entirely glabrous 8. *B. microphylla* Donnell Smith
 - 2'. Anthers either glabrous externally or with white or sordid, grayish trichomes; plants vegetatively either glabrous or pubescent.
 3. Flowers 2.9 cm long or less.
 4. Filament tube 10 mm long or more; hypanthium 3–6 mm long; corolla yellow or greenish.
 5. Corolla yellow; calyx lobes acute, deltoid; filament puberulous 11. *B. parviflora* F. E. Wimmer ex Standley
 - 5'. Corolla greenish; calyx lobes obtuse, oblong; filament tube distally glabrous 9. *B. morii* Wilbur
 - 4'. Filament tube less than 9 mm long; hypanthium ca. 3 mm long; corolla purplish 7. *B. kirkbridei* Wilbur
 - 3'. Flowers 3 cm long or longer.
 6. Hypanthium in anthesis cylindric to campanulate or urceolate, basally somewhat rounded and with the sides more or less parallel.
 7. Leaves lanceolate to lance-ovate, gradually long-acuminate from below the middle, 2.5 cm wide or less; plants vegetatively entirely glabrous 6. *B. glauca* (F. E. Wimmer) Gleason
 - 7'. Leaves elliptic, ovate or broadly lanceolate, usually wider than 2.5 cm; plants vegetatively usually somewhat puberulent or scaberulent.
 8. Calyx lobes 5 mm long or less.
 9. Leaf margins conspicuously denticulate or serrulate with (4–)5–9 teeth per cm X1. *B. hammelii* Wilbur
 - 9'. Leaf margins inconspicuously serrulate with 3 or fewer teeth per cm.
 10. Corolla puberulous; calyx lobes and hypanthium apiculate to puberulous; berry red 5. *B. dukei* Wilbur

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- 10'. Corolla glabrous; calyx lobes and hypanthium glabrous; berry white or greenish turning blackish.
- 11. Upper corolla lobes less than 12 mm long and the 2 lateral lobes about 7 mm long; corolla greenish; anthers externally puberulous 12. *B. pirrensis* Wilbur
- 11'. Upper corolla lobes 18 mm long or longer and the 2 lateral lobes 12–14 mm long; corolla dark red; anthers externally glabrous 3. *B. darienensis* Wilbur
- 8'. Calyx lobes usually more than 5 mm long.
- 12. Two lower anthers densely bearded apically with a dense tangle of trichomes; leaves mostly 5 cm or more wide; plants of Darién 10. *B. panamensis* Wilbur
- 12'. Two lower anthers sparingly fringed apically or glabrous with not more than a sparse fringe of trichomes; leaves mostly less than 5 cm wide; plants from west of Darién.
- 13. Corolla green or bronzy; hypanthium and calyx lobes green, drying green or stramineous, rarely suffused with purple or maroon; berry greatly inflated with a thin, bladderly wall, 2–4 cm in diameter and 2.5–5 cm long 16. *B. vulgaris* F. E. Wimmer
- 13'. Corolla predominantly purplish or green with a deep suffusion of maroon or dark purple; hypanthium and calyx lobes purplish and drying dark purplish or blackish; berry fleshy and with a substantial, thick wall, 1–2(–2.5) cm in diameter and 1–2(–3) cm long 2. *B. cyclostigmata* Donnell Smith
- 6'. Hypanthium in anthesis obconic, acutely tapering at the base with the sides strongly divergent.
- 14. Leaf margins conspicuously denticulate or serrulate with 6 or more teeth per cm X2. *B. mcvaughii* Wilbur
- 14'. Leaf margins entire to inconspicuously serrulate with 4 or fewer teeth per cm.
- 15. Calyx lobes 5 mm long or more.
- 16. Stems densely spreading hirsute with the trichomes visible without magnification; calyx lobes spreading or even reflexed, 5–10 mm long, 2.5 mm wide or wider X3. *B. obtusifolia* F. E. Wimmer
- 16'. Stems glabrous or inconspicuously appressed pubescent; calyx lobes ascendent, (7–)11–20 mm long, 2 mm or less wide 13. *B. tenuiflora* Donnell Smith
- 15'. Calyx lobes less than 4 mm long.
- 17. Corolla tube puberulent or inconspicuously appressed short-pubescent.
- 18. Pedicels and hypanthia glabrous to moderately spiculate or appressed short-pubescent or even strigillose; Panama east of Volcán Chiriquí 4. *B. dendrophila* F. E. Wimmer
- 18'. Pedicels and hypanthia moderately to densely spreading short-pubescent; Panama west of Volcán Chiriquí 15. *B. utleyi* Wilbur
- 17'. Corolla tube glabrous.
- 19. Filaments distally glabrous; anther tube externally glabrous; upper corolla lobes 7 mm long 14. *B. toroensis* Wilbur
- 19'. Filaments distally puberulous; anther tube externally puberulous; upper corolla lobes 10 mm long or longer 4. *B. dendrophila* F. E. Wimmer

X1. *Burmeistera hammelii* Wilbur. TYPE: Panama, Darién, NE slope of Cerro Sapo, approach from Garachiné, 3200 ft, *Hammel 7274* (DUKE, holotype; MO and 1 sheet to be distributed, isotypes).

Planta erecta vel scandenta, ca. 1 m alta; ramuli puberuli vel glabrati. Lamina foliorum ovata vel elliptica, 7–19 cm longa, 3.5–9 cm lata, ca. 2-plo longiora quam lata, acuta vel acuminata ad apicem et basi rotundata vel cuneata, margine serrulata 4–9 serrulatis per cm; venulosi infra strigillosi; petioli puberuli, 0.8–4 cm longi. Flores 3–4 cm longi; pedicelli glabri, 3–4 cm longi. Hypanthium cylindricum

vel obconicum, glabrum, 4–5 mm longum, 3–4 mm latum; lobi calycis deltoidi vel oblongi, acuti vel obtusi, denticulati, glabri, 2–3 mm longi. Corolla glabra, virenta; tubus 1.5–2 cm longus, ca. 2–3 mm diametro; lobi lineari vel oblongi, superiores 12–16(–18) mm longi, laterales 7–9 mm longi, inferiores 5–6.5 mm longi. Filamenta glabra vel puberula, 22–27 mm longa; tubus antherarum appressi-pilosus, 4–6 mm longus. Bacca globosa, 5–6 mm longa, 6–8 mm lata.

Erect to scandent *herb* to 1 m tall; branches inconspicuously puberulous to glabrate. Principal *leaves* with blades ovate to broadly elliptic, 7–19 cm long, 3.5–9 cm wide, ca. 2 times as long as wide, apically acute to more typically acuminate, basally rounded to somewhat cuneate, marginally conspicuously serrate throughout with ca. 4–6(–9) teeth/cm each ca. 1–1.5 mm long, glabrous on the upper surface and densely strigillose along the veins beneath; petioles 0.8–4 cm long, sparingly to moderately but always inconspicuously puberulous. *Flowers* 3–4 cm long at anthesis; pedicels solitary in the axils of the reduced (1.5–4 cm long) upper leaves and thus racemous, strongly ascendent to wide spreading, glabrous, 3–4 cm long, 1–2 mm in diameter, ebracteolate; hypanthium in anthesis cylindric to obconic, glabrous, basally acute to rounded, 4–5 mm long, 3–4 mm in diameter medially; calyx lobes deltoid to oblongish, acute to obtuse, denticulate, glabrous, 2–3 mm long, 1.5–2 mm wide basally; corolla glabrous, green, the tube 1.5–2 cm long, 2–3 mm in diameter, the lobes linear to narrowly oblong, the upper lobes falcate, 12–16(–18) mm long, the lateral lobes 7–9 mm long, the lowermost lobe 5–6.5 mm long; filament tube glabrous to puberulous, 22–27 mm long, the anthers externally appressed-pilosulose, 4–6 mm long, the lowest anthers slightly pilose-fringed. *Berries* globose, 5–6 mm long, 6–8 mm in diameter.

This species is known only from the type collection made on the Cerro Sapo in Darién. It is named for the collector, Barry Hammel, who through his particular attention to the genus *Burmeistera*, has considerably advanced our understanding of the Panamanian representatives.

X2. *Burmeistera mcvaughii* Wilbur. TYPE: Panama, Chiriquí-Bocas del Toro, border trail along continental divide ca. 5 mi NE of Boquete near Cerro Pate Macho above Palo Alto along trail above 6800 ft, *Hammel 7399* (DUKE, holotype; MO, plus 6 specimens to be distributed, isotypes).

Planta suffruticosa; ramuli puberuli. Lamina foliorum elliptica, 6–12(–16) cm longa, 3–5(–7) cm lata, 1.5–2(–3) plo longiora quam lata, acuta vel acuminate ad apicem et basi acuta vel rotunda, margine serrulata vel denticulata, 6–8 denticulatis per cm; petioli puberuli, 2–3 cm longi; folia juvenilia pinnatifida, 1–3 dissecta. Flores 3.2–4 cm longa; pedicelli puberuli, 4–7 cm longi. Hypanthium obconicum, puberulum, costatum, 5–7 mm longum, 3–5 mm latum; lobi calycis linear vel lanceolati, serrulati, puberuli, 6–8 mm longi, 1–1.2 mm lati. Corolla puberula, virenta; tubus 12–18 mm longus; lobi oblongi vel deltoidi, superiores 10–13 mm longi, laterales 6–7 mm longi, inferiores ca. 5–7 mm longi. Filamenta 22–27 mm longa, puberula; tubus antherarum puberuli. Bacca cylindrica, ca. 15 mm longa, 10–12 mm lata.

Terrestrial, scandent *shrublet* up to 2.5 m long; stems inconspicuously and minutely puberulous above with trichomes 0.1 mm long or less, glabrate below. Principal *leaves* elliptic, 6–12(–16) cm long, 3–5(–7) cm wide, mostly 1.5–2(–3) times as long as wide, apically acute to more typically acuminate, basally acute to rounded, marginally conspicuously serrulate or denticulate throughout with ca. 6–8 teeth/cm each ca. 0.2–0.4 mm long, inconspicuously and sparingly microscopically puberulous on the veins above or glabrate, moderately and incon-

spicuously microscopically puberulous on the veins beneath, the veins forming a conspicuous reticulum with a more or less distinct marginal vein ca. 1 mm from the edge; juvenile leaves greatly dissected, 1–2-pinnatifid; petioles mostly 2–3 cm long, sparingly puberulous to glabrate. *Flowers* 3.2–4 cm long; pedicels solitary in the upper leaf axils, ascendent, straight to somewhat curving, puberulous, ebracteolate, 4–7 cm long; hypanthium at anthesis obconic, basally acute, moderately to densely but microscopically puberulent, the trichomes less than 0.1 mm long, slightly curved and mostly restricted to the 10 proximal vertical costae, 5–7 mm long, distally 3–5 mm in diameter; calyx lobes linear to narrowly lanceolate, acute, inconspicuously serrulate, ascendent, inconspicuously minutely puberulous on both surfaces with hyaline trichomes 0.1 mm long, 6–8(–9) mm long, medially 1–1.2 mm wide; corolla moderately to densely but inconspicuously puberulous with hyaline trichomes 0.1 mm long or less, pale green, the tube 12–18 mm long, the lobes falcately oblong to deltoid, acute, the 2 upper lobes 10–13 mm long, the 2 lateral lobes 6–7 mm long, the lowermost lobe 5–7 mm long; filament tube exerted, 22–27 mm long, distally moderately spreading puberulous, the anthers 3–5 mm long, moderately to densely spreading puberulous, apically with the two shortest anthers with a short pilose fringe. *Berries* broadly cylindric, ca. 15 mm long, 10–12 mm in diameter.

This species seemingly most closely resembles *Burmeistera dendrophila* F. E. Wimmer and *B. utleyi* Wilbur which are also known only from the mountainous border area between the Panamanian provinces of Chiriquí and Bocas del Toro. *Burmeistera mcvaughii* differs from both of these species in its more broadly elliptical leaves and pronouncedly serrulate to denticulate margin and its narrowly lanceolate to linear, acute calyx lobes. Barry Hammel, who has had the most field experience with these species, has observed that *B. mcvaughii* occurs at somewhat higher elevations and in more exposed, mist-swept habitats.

The species is named, as a small token of esteem, for Professor Rogers McVaugh who has recently retired from his role as Professor of Botany and Curator of Vascular Plants at the University of Michigan. Among his numerous botanical achievements, he has long been the leading student of the American Campanulaceae; hence it is most fitting that his labors of more than forty years ago in producing the basic treatment of the lobeliads for the *North American Flora* be recalled by those of us who have been attracted to these plants not only by their beauty but by the availability of his eminently useful account. All wish him well in his efforts to complete the extremely ambitious *Flora Novogaliciana* upon which he has devoted so much effort during the past three decades. To complete it in a manner satisfying his own high standards will require a long, healthy and happy period of “retirement” and we all wish him that. The orthography of the specific epithet is not in accord with Recommendation 73C4 of the International Code; it is doubtful if Dr. McVaugh would approve such a rendition of his patronymie.

Other Specimens Examined: PANAMA. CHIRIQUÍ-BOCAS DEL TORO: In forest near top of continental divide ridge along trail towards Cerro Pate Macho, above Palo Alto, ca. 4 mi NE of Boquete, 6800 ft, *Hammel 6490* (DUKE, MO).

X3. *Burmeistera obtusifolia* F. E. Wimmer

This is the first collection of this species seen from Panama. Previously *Burmeistera obtusifolia* was known only from the northern slopes of the Cordillera de Talamanca in Costa Rica and apparently also from the Volcán Turrialba. The presence of this species in western Panama is a range extension of approximately 290 km and is another lobeliad now reported from western Panama, all of which were previously unknown from any area closer than the central Talamancas of Costa Rica. These recent extensions include, in addition to *B. obtusifolia*, *B. parviflora* F. E. Wimmer ex Standley, *Centropogon gutierrezii* (Planch. & Oerst.) F. E. Wimmer and *C. smithii* F. E. Wimmer. There are differences in both vegetative and floral pubescence and in floral dimensions between the Costa Rican and Panamanian collections but their importance can properly only be evaluated after additional collections have been made.

Specimens Examined: PANAMA. CHIRIQUÍ-BOCAS DEL TORO: Border trail along continental divide ca. 5 mi NE of Boquete near Cerro Pate Macho above Palo Alto, 7100 ft, *Hammel 7370* (DUKE, MO, and specimens to be distributed).

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